

Remarks

The previous Official Action was a restriction, under 35 U.S.C. 121 and 372, that identified four inventions, Groups I-IV.

Responsive to this restriction requirement, Applicant elected Group I, claims 1-14 and 18-20, drawn to a method for desulfurizing hydrocarbon oils.

Claims 15-17 have been withdrawn, and are now being cancelled without prejudice.

IDS

The Official Action indicated that the IDS filed 20 October 2006 did not include a concise explanation of relevance.

The Information Disclosure Statement that was filed on October 20, 2006 did include a statement of relevance. As to the Japanese language references, the International Search Report further indicates a degree of relevance.

The International Search Report indicates a category (A, Y, X) that also indicates a degree of relevance.

Therefore, the IDS is believed to have been proper. Consideration of the IDS is requested.

If Applicant has misunderstood, it is requested that the deficiency be clarified.

Priority

According to the PTO records, copies of the Japanese priority applications were received.

This receipt is indicated by the Notice of Acceptance of Application mailed September 24, 2008. Therefore, the requirements of 35 USC 119(b) appear to have been satisfied.

If Applicant has misunderstood, it is requested that the deficiency be clarified.

Claim Rejections - 35 USC § 102

Claims 1-6, 11-13, 18 and 19 were rejected under 35 U.S.C. 102(b) as being anticipated by Toida (WO 2003/097771). Hereinafter, the WIPO document is cited from the English translation, US 2005/0173297.

Claim Rejections - 35 USC § 103

Claims 7, 14 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Toida (WO 2003/097771), noting that the WIPO document is cited from the English translation, US 2005/0173297.

Claims 8 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Toida (WO 2003/097771) in view of Imura et al. (EP 1 142 636).

Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Toida (WO 2003/097771) in view of Takase et al. (Abstract of JP 2-132186, as provided by Applicant).

The rejections are traversed.

The claims have been amended to incorporate, into the independent claim, subject matter previously found in the dependent claims. No new matter is entered by these amendments.

Toida discloses a method of desulfurization using an adsorptive desulfurization agent comprising a carbon material. More specifically, Toida discloses that zeolite shows excellent performance in adsorbing mercaptan, chain sulfide, cyclic sulfide and thiophene, that zeolite such as mordenite, β -zeolite and faujasite type zeolite is used, and that the faujasite type zeolite with a molar ratio of $\text{SiO}_2/\text{Al}_2\text{O}_3$ being not more than 20 mol/mol is preferably usable (para [0084], [0085] and [0086]).

Note that "activated carbon containing a transition metal oxide" has been cancelled from claim 1 and claim 12 has been limited the zeolite to the proton-type zeolite which had a content of cations other than proton of 5 mass % or less.

This is not taught or suggested by the prior art.

On the contrary, Toida discloses that non-proton-type zeolite is preferable (para [0088]).

In the present invention sulfur compounds are made to react with one another and thus produced heavy sulfur compounds

are desulfurized by adsorption, while Toida intends to adsorb sulfur compounds as they are.

Hence, the present invention can desulfurize sulfur compounds efficiently from hydrocarbon oils which have high content of aromatic hydrocarbons.

In view of these differences, it is clear that the objects of the present invention and Toida are different and therefore, one of skill would not modify Toida to satisfy the present claim limitations.

The Applicant has rewritten the results of Examples and Comparative Examples in the attached table.

The examples of amended claim 1 are shown with gray background. It is clear that the zeolite of claim 1 shows good performance in adsorptive desulfurization. Examples 2-3, 3-3, 4-3 ... 8-3 using H-Y zeolite become comparative examples because the molar ratio of $\text{SiO}_2/\text{Al}_2\text{O}_3$ exceeds 100.

Thus, the present invention is novel and not obvious over Toida.

Imura et al. discloses a catalyst for hydrodesulfurization comprising a support comprising zirconium oxide or zirconium hydroxide, and i) palladium, ii) palladium and platinum, or iii) nickel.

The present invention is an adsorption desulfurization which does not accompany hydration. Thus, the mechanism of

desulfurization in the invention is totally different from Imura et al.

Thus, the present invention is both novel and non-obvious over Imura et al.

Takase et al. discloses a method of removing sulfur compounds by contacting a liquid containing sulfur compounds with a desulfurization agent which comprises active carbon supporting copper oxide.

The recitation of "active carbon containing a transition metal oxide" has been cancelled from claim 1. Therefore, Takase et al. is not relevant to the pending claim set. Further, Takase et al. does not cure the defects of Toida and Imura et al.

Reconsideration and allowance of claim 1 and its dependent claims are solicited.

Double Patenting

Claims 1-4, 8, 9, 13, 18 and 19 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-7 and 15-18 of copending Application No. 11/997,608.

The Official Action noted that although the conflicting claims are not identical, they are not patentably distinct from each other because both applications claim a method of desulfurization of hydrocarbon oil (i.e. kerosene) comprising

bringing a hydrocarbon oil containing benzothiophenes and dibenzothiophenes into contact with a solid acid catalyst and activated carbon. The Official Action also noted that the rejection was a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim 1 has been amended with subject matter of prior claims 5-8. Therefore, the scope of claim 1 is outside the provisional rejection. Claim 1 is now believed to be patentably distinct from the claims of pending application 11/997,608.

Withdrawal of the double patenting rejection is therefore solicited.

The Commissioner is hereby authorized in this, concurrent, and future submissions, to charge any deficiency or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Roland E. Long, Jr./

Roland E. Long, Jr., Reg. No. 41,949
Customer No. 00466
209 Madison Street, Suite 500
Alexandria, VA 22314
Telephone (703) 521-2297
Telefax (703) 685-0573
(703) 979-4709

REL/lrs

Appendix:

- Example and Comparative example about zeolite